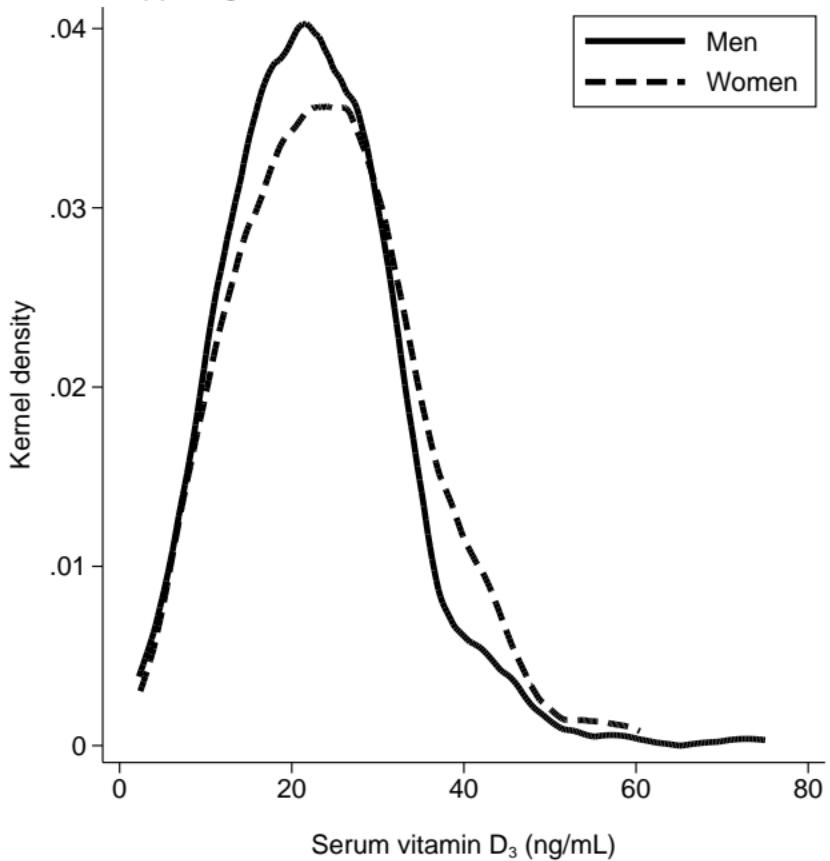
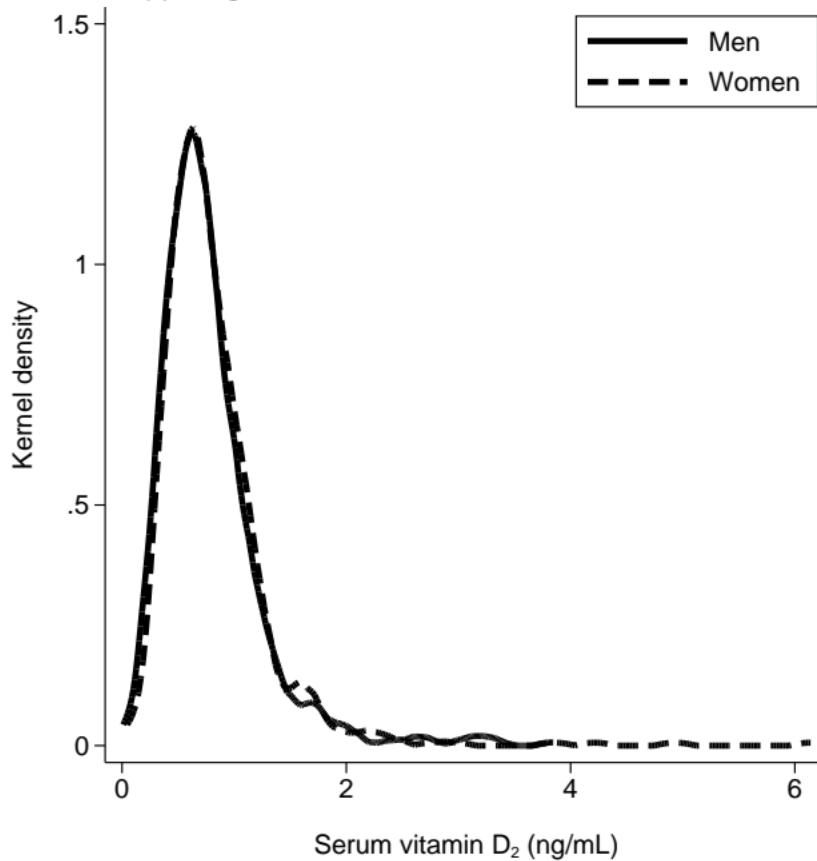


Suppl. Fig. 1A



Suppl. Fig. 1B



1 **Supplement Table 1:** Factors associated with square-root transformed urinary calcium excretion (mg/kg/24h), by sex.

	MEN				WOMEN			
	Model 1		Model 2		Model 1		Model 2	
	Δ square-root urinary calcium (95% CI)	P value	Δ square-root urinary calcium (95% CI)	P value	Δ square-root urinary calcium (95% CI)	P value	Δ square-root urinary calcium (95% CI)	P value
Age [per 10 years]	-0.04 (-0.06 to -0.02)	<0.001	0.05 (0.03 to 0.09)	<0.001	-0.02 (-0.04 to -0.01)	0.03	0.06 (0.03 to 0.08)	<0.001
BMI [kg/m^2]	-0.01 (-0.02 to -0.01)	0.02	0.01 (-0.01 to 0.01)	0.25	-0.02 (-0.02 to -0.01)	<0.001	-0.01 (-0.01 to 0.01)	0.99
Mean BP [mmHg]	-0.01 (-0.01 to 0.01)	0.53	0.01 (-0.01 to 0.01)	0.31	-0.01 (-0.01 to 0.01)	0.85	0.01 (-0.01 to 0.01)	0.13
Serum corrected calcium [mg/dL]	0.08 (-0.01 to 0.16)	0.08	0.07 (-0.01 to 0.14)	0.10	0.20 (0.12 to 0.27)	<0.001	0.22 (0.15 to 0.29)	<0.001
Vitamin D, Tertile 1 [ng/mL]	Ref		Ref		Ref		Ref	
Vitamin D, Tertile 2 [ng/mL]	0.09 (0.02 to 0.17)	0.02	0.06 (-0.01 to 0.13)	0.06	0.09 (0.01 to 0.17)	0.02	0.06 (-0.01 to 0.13)	0.06
Vitamin D, Tertile 3 [ng/mL]	0.18 (0.10 to 0.26)	<0.001	0.13 (0.06 to 0.20)	<0.001	0.10 (0.02 to 0.17)	0.01	0.04 (-0.02 to 0.11)	0.20
Urea [mg/dL]	-0.01 (-0.01 to -0.01)	0.002	N/I		-0.01 (-0.01 to 0.01)	0.43	N/I	
eGFR mL/min/1.73m ²	0.06 (0.04 to 0.07)	<0.001	0.06 (0.04 to 0.09)	<0.001	0.03 (0.01 to 0.04)	0.001	0.05 (0.03 to 0.07)	<0.001
Urinary phosphate [g/kg/24h]	10.64 (8.99 to 12.29)	<0.001	5.66 (3.46 to 7.85)	<0.001	10.54 (8.96 to 12.13)	<0.001	6.16 (4.29 to 8.04)	<0.001
Creatininuria [mg/kg/24h]	0.03 (0.03 to 0.04)	<0.001	0.02 (0.01 to 0.03)	<0.001	0.04 (0.03 to 0.04)	<0.001	0.03 (0.02 to 0.04)	<0.001
Urinary volume [L]	0.08 (0.04 to 0.11)	<0.001	0.06 (0.02 to 0.09)	0.001	0.09 (0.06 to 0.12)	<0.001	0.04 (0.01 to 0.07)	0.01
Alcohol use	0.11 (0.02 to 0.21)	0.02	0.06 (-0.02 to 0.14)	0.17	0.13 (0.07 to 0.20)	<0.001	0.07 (0.02 to 0.13)	0.01
Smoking	0.15 (0.07 to 0.24)	<0.001	0.09 (0.01 to 0.16)	0.03	0.11 (0.03 to 0.20)	0.01	0.08 (0.01 to 0.15)	0.04
Physical activity	0.03 (-0.04 to 0.09)	0.38	N/I		0.06 (-0.01 to 0.12)	0.08	N/I	
French speaking region	Ref		Ref		Ref	-	Ref	
German speaking region	-0.06 (-0.13 to 0.01)	0.10	-0.09 (-0.16 to -0.03)	0.005	-0.03 (-0.10 to 0.05)	0.49	-0.06 (-0.13 to -0.01)	0.04
Italian speaking region	-0.01 (-0.11 to 0.10)	0.92	-0.05 (-0.14 to 0.04)	0.27	0.00 (-0.10 to 0.11)	0.96	-0.01 (-0.10 to 0.07)	0.81
Menopause	-		-		-0.02 (-0.09 to 0.04)	0.46	N/I	
<u>Drugs</u>								
Calcium supplementation	-0.19 (-0.52 to 0.15)	0.28	0.03 (-0.27 to 0.33)	0.86	0.06 (-0.08 to 0.19)	0.42	0.18 (0.06 to 0.30)	0.004
Vitamin D supplementation	-0.07 (-0.41 to 0.27)	0.69	-0.12 (-0.43 to 0.18)	0.42	-0.10 (-0.34 to 0.14)	0.43	-0.11 (-0.30 to 0.09)	0.30
Diuretics	-0.41 (-0.78 to -0.04)	0.03	-0.12 (-0.43 to 0.20)	0.46	-0.30 (-0.72 to 0.11)	0.15	-0.15 (-0.49 to 0.19)	0.40
Corticoids	-0.30 (-1.12 to 0.52)	0.47	N/I		0		N/I	
ACEI	-0.19 (-0.33 to -0.06)	0.005	-0.14 (-0.26 to -0.01)	0.03	-0.24 (-0.42 to -0.07)	0.007	-0.15 (-0.30 to -0.01)	0.05
ARB	-0.18 (-0.29 to -0.08)	0.001	-0.10 (-0.20 to -0.01)	0.05	-0.30 (-0.43 to -0.17)	<0.001	-0.24 (-0.35 to -0.12)	<0.001
Thyroid hormone substitution	-0.31 (-0.72 to 0.10)	0.14	N/I		-0.01 (-0.16 to 0.16)	0.98	N/I	
Oral contraceptive pill	-		-		-0.06 (-0.16 to 0.03)	0.19	N/I	
Estrogen hormone substitution	-		-		0.07 (-0.07 to 0.22)	0.30	N/I	

2 This table is the result of a multivariable linear regression. Urinary calcium excretion used as the dependant variable (in mg/kg/24h) was square-root transformed to better achieve a normal distribution of the residuals. Model 1: Unadjusted model. Model 2: Full adjusted model (we kept covariates with a P value<0.1 and forced into the model age, linguistic region, diuretics, calcium and vitamin D supplementations). Abbreviations: BMI: body mass index; Mean BP: mean arterial blood pressure; Vitamin D: includes 25(OH)D₂₊₃ expressed in month-specific tertile; eGFR: estimated glomerular filtration rate by ckd-epi equation; ACEI: angiotensin-converting-enzyme inhibitor; ARB: angiotensin receptor blocker; N/I: not included in the multivariate linear regression

7

8

9 **Supplement Table 2:** Association of 25 (OH) D and protein-corrected serum calcium with square-root transformed urinary calcium excretion
10 (mg/kg/24h), by sex.

	MEN				WOMEN			
	Model 1 Δ square-root urinary calcium (95% CI)	P value	Model 2 Δ square-root urinary calcium (95% CI)	P value	Model 1 Δ square-root urinary calcium (95% CI)	P value	Model 2 Δ square-root urinary calcium (95% CI)	P value
Models including only D₂								
Vitamin D ₂ , Tertile 1 [ng/mL]	Ref		Ref		Ref		Ref	
Vitamin D ₂ , Tertile 2 [ng/mL]	0.02 (-0.06 to 0.10)	0.59	0.01 (-0.05 to 0.08)	0.68	0.01 (-0.08 to 0.08)	0.99	0.01 (-0.05 to 0.08)	0.65
Vitamin D ₂ , Tertile 3 [ng/mL]	-0.01 (-0.08 to 0.07)	0.92	0.04 (-0.03 to 0.10)	0.30	-0.07 (-0.15 to 0.01)	0.09	0.01 (-0.06 to 0.07)	0.86
Serum calcium in model 2 [mg/dL]	-		0.08 (-0.01 to 0.15)	0.06	-		0.22 (0.15 to 0.29)	<0.001
Models including only D₃								
Vitamin D ₃ , Tertile 1 [ng/mL]	Ref		Ref		Ref		Ref	
Vitamin D ₃ , Tertile 2 [ng/mL]	0.09 (0.02 to 0.17)	0.02	0.07 (-0.01 to 0.13)	0.05	0.10 (0.02 to 0.18)	0.01	0.06 (-0.01 to 0.12)	0.09
Vitamin D ₃ , Tertile 3 [ng/mL]	0.18 (0.10 to 0.26)	<0.001	0.12 (0.05 to 0.19)	0.001	0.11 (0.03 to 0.18)	0.006	0.05 (-0.02 to 0.11)	0.16
Serum calcium in model 2 [mg/dL]	-		0.06 (-0.01 to 0.14)	0.10	-		0.22 (0.15 to 0.29)	<0.001
Models including only D₂₊₃								
Vitamine D ₂₊₃ , T1 [ng/mL]	Ref		Ref		Ref		Ref	
Vitamine D ₂₊₃ , T2 [ng/mL]	0.09 (0.12 to 0.10)	0.01	0.06 (-0.00 to 0.13)	0.06	0.09 (0.01 to 0.17)	0.02	0.06 (-0.00 to 0.13)	0.05
Vitamine D ₂₊₃ , T3 [ng/mL]	0.18 (0.10 to 0.26)	<0.001	0.13 (0.05 to 0.20)	<0.001	0.10 (0.02 to 0.17)	0.01	0.04 (-0.02 to 0.11)	0.19
Serum calcium in model 2 [mg/dL]	-		0.06 (-0.01 to 0.14)	<0.001	-		0.22 (0.15 to 0.29)	<0.001
Models including D₂ and D₃								
Vitamin D ₂ , Tertile 1 [ng/mL]	Ref		Ref		Ref		Ref	
Vitamin D ₂ , Tertile 2 [ng/mL]	0.02 (-0.06 to 0.09)	0.69	0.10 (-0.06 to 0.08)	0.76	0.01 (-0.08 to 0.08)	0.99	0.02 (-0.05 to 0.08)	0.65
Vitamin D ₂ , Tertile 3 [ng/mL]	-0.01 (-0.08 to 0.08)	0.94	0.03 (-0.03 to 0.10)	0.32	-0.06 (-0.14 to 0.02)	0.13	0.01 (-0.06 to 0.08)	0.77
Vitamin D ₃ , Tertile 1 [ng/mL]	Ref		Ref		Ref		Ref	
Vitamin D ₃ , Tertile 2 [ng/mL]	0.11 (0.03 to 0.18)	0.007	0.07 (-0.01 to 0.13)	0.06	0.10 (0.02 to 0.18)	0.01	0.06 (-0.01 to 0.12)	0.09
Vitamin D ₃ , Tertile 3 [ng/mL]	0.18 (0.10 to 0.26)	<0.001	0.12 (0.05 to 0.19)	0.001	0.10 (0.03 to 0.18)	0.009	0.05 (-0.02 to 0.11)	0.17
Serum calcium in model 2 [mg/dL]	-		0.07 (-0.01 to 0.14)	0.10	-		0.22 (0.15 to 0.29)	<0.001

11 This table is the result of a multivariable linear regression. Urinary calcium excretion used as the dependant variable (in mg/kg/24h) was square-root transformed to better achieve a
12 normal distribution of the residuals. Model 1: Unadjusted model. Model 2: Full adjusted model (we kept covariates with a P value<0.1 and forced into the model age, linguistic region,
13 diuretics, calcium and vitamin D supplementations). Vitamin D2: Vitamin D was included as 25(OH)D₂ into the models. Vitamin D3: Vitamin D was included as 25(OH)D₃ into the
14 models. Serum 25(OH)D₂, 25(OH)D₃ and 25(OH)D₂₊₃ were divided into month-specific tertiles with the first tertile having the lowest value and the third tertile having the highest value.
15 Serum calcium = serum protein-corrected calcium
16

17 **Supplementary table 3a:** Stratified analyses by low vs high excretions of sodium, potassium and urea and alcohol status for the association of 25(OH)D and
 18 protein-corrected serum calcium with square-root transformed urinary calcium excretion and their influence on calcium and 25(OH)D₂₊₃ in men

MEN	Δ square-root urinary calcium	SE	P value	Δ square-root urinary calcium	SE	P value	P Interaction*
Low urinary sodium excretion (<176 mEq/24h), (n=312)				High urinary sodium excretion (\geq176 mEq/24h), (n=312)			
Corrected serum calcium [mg/dL]	1.21	0.52	0.02	0.13	0.51	0.80	0.37
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.59	0.44	0.18	0.45	0.43	0.30	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	1.04	0.45	0.02	1.11	0.47	0.02	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.06**			0.05**	0.78
Low urinary potassium excretion (<72 mEq/24h), (n=312)				High urinary potassium excretion (\geq72 mEq /24h), (n=312)			
Corrected serum calcium [mg/dL]	0.69	0.52	0.19	0.32	0.49	0.52	0.96
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.76	0.41	0.06	0.40	0.46	0.39	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	1.48	0.45	0.001	0.67	0.49	0.17	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.003**			0.35**	0.74
Low urinary urea excretion (<410 mEq /24h), (n=312)				High urinary urea excretion (\geq410 mEq /24h), (n=312)			
Corrected serum calcium [mg/dL]	0.49	0.50	0.33	0.98	0.51	0.06	0.16
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.37	0.41	0.37	0.39	0.46	0.40	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.88	0.44	0.05	1.07	0.49	0.03	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.12**			0.07**	0.90
Alcohol intake (n=535)				No alcohol intake (n=89)			
Corrected serum calcium [mg/dL]	0.56	0.39	0.15	-0.19	0.99	0.85	0.86
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.57	0.34	0.09	0.60	0.66	0.37	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.86	0.36	0.02	2.15	0.71	0.004	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.05**			0.004**	0.25

19 This table is the result of multivariable linear regression, stratified by selected covariates. Urinary calcium excretion used as the dependant variable (in mg/24h) was square-root transformed to better
 20 achieve a normal distribution of the residuals. Model 1: Unadjusted model. Model 2: Full adjusted model (we kept covariates with a P value<0.1 and forced into the model age, linguistic region,
 21 diuretics, calcium and vitamin D supplementations). Vitamin D2: Vitamin D was included as 25(OH)D₂ into the models. Vitamin D3: Vitamin D was included as 25(OH)D₃ into the models. Serum
 22 25(OH)D₂, 25(OH)D₃ and 25(OH)D₂₊₃ were divided into month-specific tertiles with the first tertile having the lowest value and the third tertile having the highest value. Serum calcium = serum protein-
 23 corrected calcium. * P for interaction between strata. ** P value for a likelihood ratio test for the effect of vitamin D tertiles.

24 **Supplementary table 3b:** Stratified analyses by low vs high excretions of sodium, potassium and urea and alcohol status for the association of 25 (OH) D and
 25 protein-corrected serum calcium with square-root transformed urinary calcium excretion and their influence on calcium and 25(OH)D₂₊₃ in women

WOMEN	Δ square-root urinary calcium	SE	P value	Δ square-root urinary calcium	SE	P value	P Interaction*
Low urinary sodium excretion (<125 mEq /24h), (n=335)				High urinary sodium excretion (≥125 mEq /24h), (n=334)			
Corrected serum calcium [mg/dL]	0.94	0.38	0.01	2.40	0.41	<0.001	0.02
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	1.35	0.36	<0.001	-0.30	0.40	0.45	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.59	0.36	0.10	0.16	0.40	0.69	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			<0.001**			0.48**	0.02
Low urinary potassium excretion (<58 mEq /24h), (n=334)				High urinary potassium excretion (≥58 mEq /24h), (n=335)			
Corrected serum calcium [mg/dL]	1.58	0.41	<0.001	2.00	0.41	<0.001	0.22
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.55	0.38	0.15	0.48	0.41	0.25	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.07	0.37	0.85	0.55	0.41	0.18	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.27**			0.33**	0.80
Low urinary urea excretion (<297 mEq /24h), (n=335)				High urinary urea excretion (≥297 mEq /24h), (n=334)			
Corrected serum calcium [mg/dL]	1.66	0.38	<0.001	1.95	0.42	<0.001	0.66
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.60	0.37	0.10	0.39	0.40	0.33	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.16	0.36	0.66	0.29	0.40	0.48	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.21**			0.58**	0.90
Alcohol intake (n=443)				No alcohol intake (n=226)			
Corrected serum calcium [mg/dL]	1.97	0.36	<0.001	1.21	0.49	0.02	0.07
2 nd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.73	0.34	0.03	0.17	0.47	0.71	
3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]	0.69	0.33	0.04	-0.41	0.50	0.41	
2 nd + 3 rd Tertile 25(OH)D ₂₊₃ [ng/mL]			0.05**			0.48**	0.19

26 This table is the result of multivariable linear regression, stratified by selected covariates. Urinary calcium excretion used as the dependant variable (in mg/24h) was square-root transformed to better
 27 achieve a normal distribution of the residuals. Model 1: Unadjusted model. Model 2: Full adjusted model (we kept covariates with a P value<0.1 and forced into the model age, linguistic region,
 28 diuretics, calcium and vitamin D supplementations). Vitamin D2: Vitamin D was included as 25(OH)D₂ into the models. Vitamin D3: Vitamin D was included as 25(OH)D₃ into the models. Serum
 29 25(OH)D₂, 25(OH)D₃ and 25(OH)D₂₊₃ were divided into month-specific tertiles with the first tertile having the lowest value and the third tertile having the highest value. Serum calcium = serum protein-
 30 corrected calcium. * P for interaction between strata. ** P value for a likelihood ratio test for the effect of vitamin D tertiles.

31 **Supplement table 4:** Sex-by-serum calcium and sex by vitamin D tertiles interactions for their effects on urinary calcium excretion, within each sodium,
32 potassium, urea urinary excretion strata and alcohol status

Strata	P interaction sex* serum calcium	P interaction sex*vitamin D tertiles*
Low urinary sodium excretion	0.24	0.47
High urinary sodium excretion	0.008	0.06
Low urinary potassium excretion	0.04	0.19
High urinary potassium excretion	0.04	0.16
Low urinary urea excretion	0.39	0.66
High urinary urea excretion	0.01	0.02
Alcohol intake	0.01	0.27
No alcohol intake	0.09	0.16

33

34 * P value from a likelihood ratio test for the two vitamin D tertiles. Strata were defined by sex-specific median urinary excretion for sodium, potassium and urea.